TREND STUDY 1-1-96

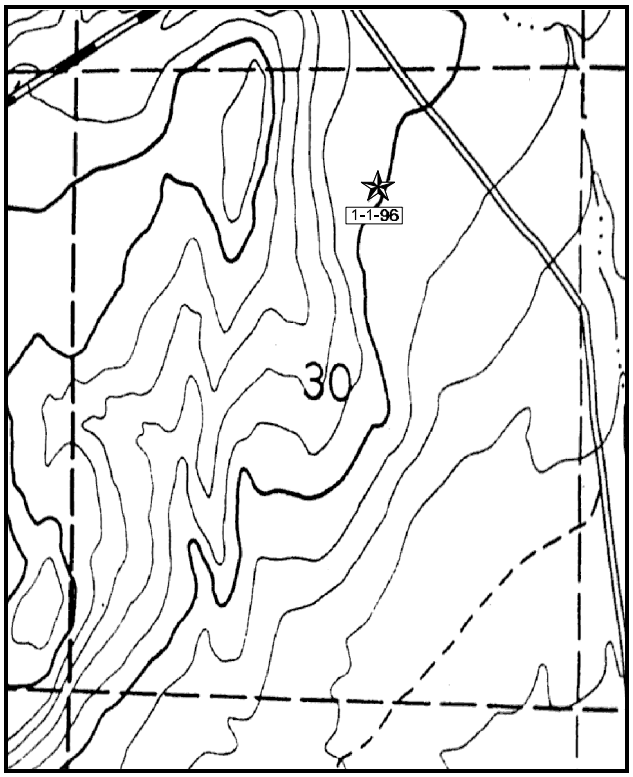
Study site name: Kelton . Range type: Sagebrush/grass .

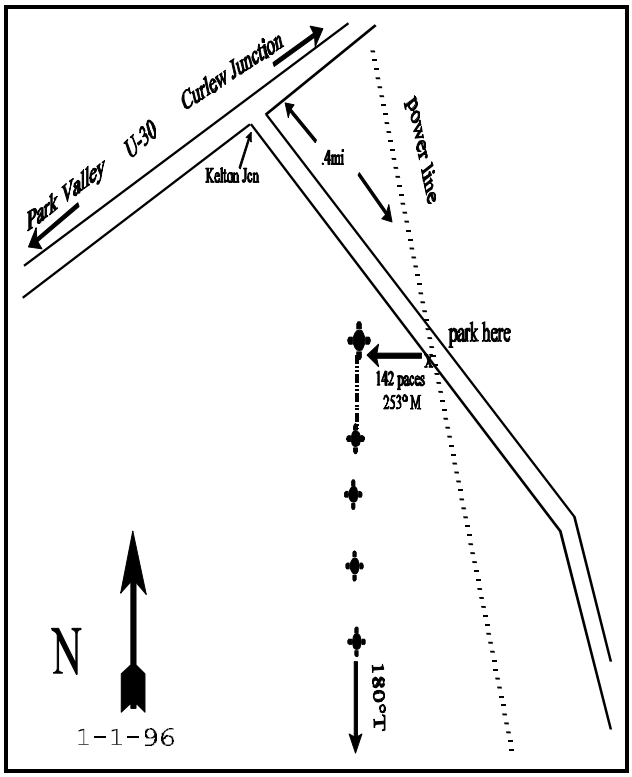
Compass bearing: frequency baseline 197 degrees.

Footmark (first frame placement) 5 feet, footmarks (frequency belts) Line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Proceed on U-30 to the Kelton Junction and turn southeast off U-30. Note mileage at the junction and proceed 0.40 miles to a point where the telephone pole line crosses the road. Stop here. From the power pole on the west side of the road, take a compass bearing of 253 degrees magnetic (directly west) and walk 142 paces to the 0-foot stake of the frequency baseline. This is a green steel fence post wired with browse tag #7905. The baseline runs true south (i.e., 180 degrees true or 197 degrees magnetic).





Map Name: Kelton Pass, Utah Diagrammatic Sketch

Township 13N Range 11W , Section 30 UTM COOR: 3-21-921E 46-33-402N

DISCUSSION

Trend Study No. 1-1

This study is located approximately one-half mile south of the Kelton Junction on Highway U-30. Identified as an important deer and antelope winter range, the study area often has concentrations of both animals. Antelope and deer pellet groups were abundant in the past. Elevation is approximately 4,640 feet on nearly level to gently sloping terrain with a slight east or east-southeast aspect. The range type is basin big sagebrush with an extensive understory of cheatgrass.

Soil is alluvial in origin and basalt derived. Soil is a loam in texture and is relatively deep. Apart from a few basalt outcrops and boulders, surface rockiness is minimal. Organic matter content is lacking (1.6%) and is primarily derived from a nearly uniform understory cover of dead cheatgrass. Shrubs in the past comprised the primary vegetative cover and in combination with cheatgrass, litter and rock provide a nearly complete ground cover. Fire before 1990 has reduced it to less than 3%. Soil erosion is minimal.

Browse composition is dominated by basin big sagebrush but there are also small numbers of white rubber rabbitbrush. During the 1984 reading, total browse density was estimated at 3,000 plants/acre, 91% of which was basin big sagebrush. This species showed evidence of heavy use, but exhibited good vigor and a stable age structure. Between 1984 and 1990, a fire burned the area reducing the sagebrush to only 132 plants/acre. By 1996, density of basin big sagebrush increased to 560 plants/acre, 61% of which are young plants.

Currently, understory vegetation is depleted and consists almost entirely of annuals, primarily cheatgrass which accounts for 90% of the vegetation cover. Cheatgrass forms a dense uniform cover of “fine fuel” that is a severe fire hazard when it is dry. Perennial grasses are limited to isolated individuals of bottlebrush squirrel-tail and Sandberg bluegrass. Forbs are infrequent. Annuals and biennials such as prickly lettuce, annual stickseed, tansy-mustard, and tumble mustard are prevalent. Perennial forbs are limited to a few individuals of gooseberry leaf globemallow and longleaf phlox.

1984 APPARENT TREND ASSESSMENT

This site is essentially stable, although subjected to very heavy deer and antelope use. As a result, overall vegetative condition is below optimum, but not apparently deteriorating further. The browse component is dominant and will remain so. Understory condition is poor but stable. Soil trend is stable. Litter and vegetative cover are high and the site is nearly level, resulting in almost negligible soil erosion. The greatest threat to the site is the high fire hazard because of the dense annual grass cover. With the right conditions, one fire could eliminate most of the basin big sagebrush that is so important to deer and antelope.

1990 TREND ASSESSMENT

A fire on the study site since 1984 has dramatically changed the species composition and eliminated over 95% of the sagebrush. Quadrat frequency has gone from 21% to 2%. The area is currently dominated by cheatgrass and Russian thistle, both with 100% quadrat frequency values. Annuals were not inventoried in 1982, so no comparison can be made. Photo point comparisons with 1984 show that much of the understory consisted of cheatgrass before the burn.

TREND ASSESSMENT
soil - stable, increased bare ground but increased frequency of grasses and

forbs
browse - down after fire, poor composition and density
herbaceous understory - down after fire, dominated by annuals

1996 TREND ASSESSMENT

The soil trend has improved slightly since 1990. Percent bare ground has declined while litter cover has increased. Erosion is not a problem on this site due to the lack of slope and abundant herbaceous vegetation cover, but more than 90% is provided by annual species. The browse trend has continued to improve since the fire. Estimated density of basin big sagebrush has increased from 132 plants/acre to 560. The number of seedling and young plants have also increased. On the negative side, broom snakeweed was picked up in the 1996 reading. It currently numbers only 320 plants/acre but has an age class distribution of an expanding population. The herbaceous trend is in stable yet poor condition. Cheatgrass brome still dominates the site, providing 96% of the herbaceous vegetation cover. Perennial grasses are nearly absent. The forb composition is also dominated by annuals. Sum of nested frequency of forbs declined considerably since 1990 due to a major reduction in Russian thistle. Currently the dominant forbs consist of tumble mustard, prickly lettuce, and scarlet globemallow.

TREND ASSESSMENT
soil - improved slightly
browse - slightly up, but density are still poor and only provides about 2% total cover
herbaceous understory - stable but dominated by annuals

HERBACEOUS TRENDS --
Herd unit 01 , Study no: 1

Type	Species	Nested Frequency '84	'90	'96	Quadrat Frequency '84	'90	'96	Average Cover % '96
G	Bromus tectorum (a)	a-	b360	c380	-	100	98	33.03
G	Poa secunda	a5	a-	b17	2	-	7	.10
G	Sitanion hystrix	a14	a16	b3	8	7	1	.03
G	Unknown grass - perennial	3	-	-	1	-	-	-
Total for Grasses		22	376	400	11	107	106	33.17
F	Chaenactis douglasii	-	-	3	-	-	1	.00
F	Descurainia spp. (a)	-	13	-	-	7	-	-
F	Erigeron spp	-	-	3	-	-	1	.00
F	Euphorbia spp.	-	-	5	-	-	2	.01
F	Euclidium syriacum	-	2	-	-	1	-	-
F	Gilia spp. (a)	-	-	1	-	-	1	.00
F	Halogeton glomeratus (a)	-	24	-	-	9	-	-
F	Holosteum umbellatum (a)	-	-	3	-	-	1	.00
F	Lactuca serriola	a-	a5	b22	-	2	9	.21
F	Phlox longifolia	a5	a-	b17	3	-	9	.07
F	Salsola iberica (a)	a-	b369	c15	-	100	7	.06
F	Sisymbrium altissimum (a)	-	-	103	-	-	49	.81

Type	Species	Nested Frequency '84	'90	'96	Quadrat Frequency '84	'90	'96	Average Cover % '96
F	Sphaeralcea grossulariaefolia	2	9	4	1	5	2	.15
F	Tragopogon dubius	3	-	1	1	-	1	.00
F	Unknown forb-perennial	3	-	-	1	-	-	-
Total for Forbs		13	422	177	6	124	83	1.34

Values with different subscript letters are significantly different at % = 0.10 (annuals excluded)

BROWSE TRENDS --
Herd unit 01 , Study no: 1

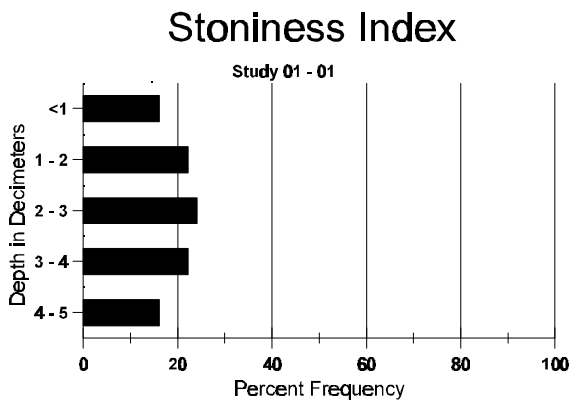
Type	Species	Strip Frequency '96	Average Cover % '96
B	Artemisia tridentata tridentata	13	1.60
B	Chrysothamnus nauseosus albicaulis	4	.30
B	Chrysothamnus nauseosus consimilis	2	.38
B	Gutierrezia sarothrae	10	.06
Total for Browse		29	2.34

BASIC COVER --
Herd unit 01 , Study no: 1

Cover Type	Nested Frequency '96	Average Cover % '84	'90	'96
Vegetation	388	2.00	23.00	39.01
Rock	111	1.25	.75	2.93
Pavement	182	.25	1.25	2.15
Litter	400	80.75	54.25	69.33
Cryptogams	78	8.25	0	1.11
Bare Ground	155	7.50	20.75	4.40

SOIL ANALYSIS DATA --
Herd Unit 01, Study no: 1

Effective rooting depth (inches)	Temp °F (depth)	PH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
19.7	61.2 (18.3)	8.2	43.6	34.4	28.0	1.6	15.5	700.8	.61



PELLET GROUP FREQUENCY --
Herd unit 01 , Study no: 1

Type	Quadrat Frequency '96
Cattle	4

BROWSE CHARACTERISTICS --
Herd unit 01 , Study no: 1

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata tridentata																		
S	84	3	2	-	-	-	-	-	-	-	4	1	-	-	166			5
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	2	-	-	-	-	-	2	-	-	-	40			2
Y	84	2	6	2	-	-	-	-	-	-	10	-	-	-	333			10
	90	2	-	-	-	-	-	-	-	-	1	1	-	-	66			2
	96	17	-	-	-	-	-	-	-	-	17	-	-	-	340			17
M	84	1	15	31	-	-	-	-	-	-	46	-	1	-	1566	27	34	47
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	33	10	8	1
	96	11	-	-	-	-	-	-	-	-	11	-	-	-	220	21	25	11
D	84	-	7	12	-	-	-	1	-	-	6	-	12	2	666			20
	90	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
Total Plants/Acre (excluding Dead & Seedlings)													'84		2565	Dec:		26%
													'90		132			25%
													'96		560			0%
Chrysothamnus nauseosus albicaulis																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	1	-	-	-	-	-	-	-	1	-	-	-	33	22	26	1
	96	6	-	-	-	-	-	-	-	-	6	-	-	-	120	20	30	6
Total Plants/Acre (excluding Dead & Seedlings)													'84		0	Dec:		-
													'90		33			-
													'96		120			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus consimilis																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	11	-	-	-	-	-	-	-	-	11	-	-	-	220	16	16	11
Total Plants/Acre (excluding Dead & Seedlings)													'84		0	Dec:		-
													'90		0			-
													'96		220			-
Chrysothamnus viscidiflorus stenophyllus																		
Y	84	3	-	-	-	-	-	-	-	-	2	1	-	-	100			3
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	84	1	-	-	-	-	-	-	-	-	1	-	-	-	33	12	20	1
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	21	38	0
D	84	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
Total Plants/Acre (excluding Dead & Seedlings)													'84		199	Dec:		33%
													'90		0			0%
													'96		0			0%
Grayia spinosa																		
M	84	-	-	2	-	-	-	-	-	-	2	-	-	-	66	33	48	2
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	25	50	0
Total Plants/Acre (excluding Dead & Seedlings)													'84		66	Dec:		-
													'90		0			-
													'96		0			-
Gutierrezia sarothrae																		
S	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	14	-	-	1	-	-	-	-	-	15	-	-	-	300			15
Y	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	96	7	-	-	-	-	-	-	-	-	7	-	-	-	140			7
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	9	-	-	-	-	-	-	-	-	9	-	-	-	180	11	16	9
Total Plants/Acre (excluding Dead & Seedlings)													'84		0	Dec:		-
													'90		0			-
													'96		320			-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Leptodactylon pungens																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	7	16	0
Total Plants/Acre (excluding Dead & Seedlings)													'84		0	Dec:		-
													'90		0			-
													'96		0			-
Opuntia fragilis																		
M	84	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	90	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	96	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	6	0
Total Plants/Acre (excluding Dead & Seedlings)													'84		0	Dec:		-
													'90		0			-
													'96		0			-